The habits of the species of *Pycnosoma* are similar to those of the well-known "green-bottle flies" (*Lucilia*), and there can be little doubt that *P. marginale* and *P. chloropyga*, in addition to *Musca domestica*, L., were partly responsible for the spread of enteric fever among the British Army during the late war in South Africa *.

British Museum (Natural History),
Cromwell Road, S.W.
Jan. 30, 1906.

XXXIX.—*On the Freshwater Medusa* Limnocnida tanganicæ *and its Occurrence in the River Niger.*

By Edward T. Browne, Zoological Research Laboratory, University College, London.

In the collection brought back by the late J. S. Budgett from the delta of the Niger in 1903 there were five specimens of a Medusa taken in a freshwater lagoon near Assay, on the Forcados River, one of the western branches of the Niger, and about 102 geographical miles from the sea. The occurrence of a Medusa in the Niger was, however, first noticed by Dr. Tautain in 1888. He caught specimens near Bamakou, in the French Soudan, but failed to preserve them. As he was unable to carry out his intention of obtaining a fresh supply, a description of the Medusa was never published, but only the fact of its occurrence (1).

The Medusa found by Budgett is, I am sure, *Limnocnida tanganicæ*, Böhm. It has, however, many more tentacles and sense-organs than are mentioned by Günther (2) in the original description of the species, and it comes nearer to the description given by Gravier (3) of the specimens found in the Victoria Nyanza.

The presence of *Limnocnida tanganicæ* in the Niger is, I think, more interesting than the discovery of a new freshwater species, as the Medusa is found in a river far away from the Great African Lakes.

The occurrence of freshwater Medusæ in a river which has direct communication with the sea naturally suggests the idea that the Medusæ have gradually migrated up the river and

* See E. E. Austen, "The House-Fly and certain Allied Species as Disseminators of Enteric Fever among Troops in the Field," Journal of the Royal Army Medical Corps, June 1904, pp. 1–16, pls. i. & ii.

have changed their habitat from salt to fresh water, just as the Hydroid *Cordylophora* has done. Even if the change of habitat originally took place in the Niger, and not in Lake Tanganyika, we should still have to find the means of conveyance across the African continent. Mr. Boulenger, in his Presidential Address to the Zoological Section of the British Association at its meeting last year in South Africa, appears to me to have clearly shown the road ('Nature,' Aug. 1905, p. 417). Palæontological evidence points to the fact that a sea extended over the greater part of Africa above the Equator during a part of the Eocene period. "On this retreating northwards after the Lutetian period, Medusæ became land-locked and gradually adapted themselves to fresh water." With a sea stretching across the Soudan one can account for the presence of *Limnocnida* in the Niger and in the Great Lakes. It removes the need to speculate about the Medusæ ascending the Niger from the Atlantic and migrating across Africa.

Our knowledge of the life-history of *Limnocnida* is due to Mr. Moore's observations in Lake Tanganyika. In his "Tanganyika Problem" he states that the sexually mature individuals swarm during September and October. The ova and spermatozoa are evacuated, and he found "numbers of small planulæ and small Medusæ which were growing rapidly; but these showed no tendency to form buds during the autumn, and had, without doubt, been formed from the fertilized ova of the sexual forms." Mr. Moore states clearly that the Medusa reproduces only by direct development, and has no intervening hydroid stage.

It appears to me that the weakest part in the chain of evidence for direct development is the connexion between the planulæ and the young Medusæ. Granting that the planulæ belonged to the Medusa and not to some other animal, there is no mention made of the very important stages between the planula stage and the young fully-formed Medusa. These are just the stages of which we require a full account, as they are likely to give a clue to the relationship of this peculiar Medusa to other members of the group.

The presence of young Medusæ late in the year, when the sexual adults are breeding, is a common occurrence among those Medusæ of our seas which belong to species known to have an intervening hydroid stage. These young Medusæ are late arrivals, either from a hydroid or from a Medusa which reproduces asexually by gemmation, and they usually die off without reproducing.

My knowledge of the habits of our marine Medusæ leads me to believe that *Limnocnida* has a hydroid stage in its life-history. So far as I am able to foresee, there should be no great difficulties to be overcome in rearing the fertilized ova of *Limnocnida* in small bell-jars. It would be a much quicker method than that of trying to find the hydroid in the lakes. The hydroid may have a special habitat which might take many years to find. If, on the other hand, the Medusa reproduces by direct development only, one would be able by rearing the ova to observe and preserve all the stages.

Limnocnida still remains outside any system of classification. It looks at first sight a Narcomedusa, on account of the shape of the stomach and the position of the gonads; but I do not think that it has any connexion whatever with the Narcomedusæ. Whether it is an Anthomedusa or is closely related to the Anthomedusæ should be decided when its development and life-history are definitely and clearly known. At present I am inclined to look upon *Limnocnida* as a specialized Anthomedusa. I have promised to give a description, with figures, of the specimens from the Niger in the "Budgett Memorial Volume."

References.

(1) Guerne, Jules de. 1894. "On a Medusa observed by Dr. Tautain in the River Niger at Bamakou (French Soudan)." Ann. & Mag. Nat. Hist. ser. 6, vol. xiv. pp. 29–34.

(2) Günther, R. T. 1893. "Preliminary Account of the Fresh-water Medusa of Lake Tanganyika (*Limnocnida tanganicæ*)." Ann. & Mag. Nat. Hist. ser. 6, vol. xi. pp. 269–275, pls. xiii. & xiv.

(3) Gravier, C. 1903. "Sur la Méduse du Victoria Nyanza." Comptes rendus Acad. Sci. Paris, tom. cxxxvii. pp. 867–869.

5th February, 1906.

XL.—*Descriptions and Records of Bees.*—IX.

By T. D. A. Cockerell, University of Colorado.

Andrena (*Trachandrena*) *perforatella*, sp. n.

♀.—Length about 8 mm.

Black, with the middle and hind tarsi, and the hind tibiæ, clear red; pubescence greyish white, the hair at apex of abdomen golden; wings strongly yellowish, the stigma and nervures clear ferruginous; flagellum dusky reddish beneath. Process of labrum very broad, truncate; clypeus exceedingly densely punctured, with no smooth line; facial foveæ, seen